

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 23-31 and 33 are presently pending in this case. Claims 23, 24, 27, and 28 are amended by the present amendment. As amended Claims 23, 24, 27, and 28 are supported by the original disclosure,<sup>1</sup> no new matter is added.

In the outstanding Official Action, Claims 23-31 and 33 were rejected under 35 U.S.C. §103(a) as unpatentable over Li (U.S. Patent No. 6,654,429) in view of Khayrallah et al. (U.S. Patent No. 6,047,171, hereinafter “Khayrallah”) and further in view of Mitra et al. (U.S. Patent No. 5,533,063, hereinafter “Mitra”).

The outstanding rejection is respectfully traversed.

Amended Claim 23 recites in part:

a channel estimator configured to perform a channel estimation on the basis of received pilot symbols, ***the channel estimator including a filter selector configured to adaptively select a filter for channel estimation from a plurality of available filters based on an interference reference value supplied to the filter selector;*** and

a filter configured to perform a channel estimation for data symbols between pilot symbols, said filter being further adaptively selected from the plurality of available filters on the basis of a Doppler frequency of the data symbol to be channel estimated, said channel estimation being based on an estimated carrier to interference value ratio, said estimated carrier being a wanted carrier power value at a frequency subcarrier and a timeslot of a data symbol to be channel estimated.

The outstanding Office Action concedes that “Li does not teach said filter being adaptively selected from a set of filters on the basis of an interference reference” and attempts to compensate the lack of disclosure of Li relative to this feature of Claim 23 with the disclosure of Khayrallah. The outstanding Office Action asserted that Khayrallah describes

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<sup>1</sup>See, e.g. the publication of the specification at paragraph 26.

adaptively selecting a filter in column 7, lines 9-31.<sup>2</sup> This portion of Khayrallah describes the selection of an “optimal” filter from various filters available based on values captured in a plot that has been prepared by plotting the value of the carrier to adjacent channel interferer ratio C/A versus BER for each of the filters.

Specifically, the cited portion of the reference states that:

In step 82, the value of the carrier to adjacent channel interferer ratio (C/A) is measured for each filter at various bit error rates (BER). The value of the signal energy to noise ratio is fixed at  $E_b/N_o = \epsilon_B + 3$  dB, where  $\epsilon_B$  is the signal energy to noise ratio required to achieve a 5% bit error rate. The range of measurements of BER depends on the performance requirement of the system.

In step 86, the value of the carrier to adjacent channel interferer ratio C/A is plotted versus BER for each of the filters. An example of such a plot is shown in FIG. 7 for the above described application. In this example, for simplicity, it was assumed that only interference from a left channel was present. By viewing the plot, an optimal filter for various ranges of carrier to adjacent channel interference ratio C/A that minimizes bit error rate BER may be ascertained. One can see that at low values of the carrier to adjacent channel interference ratio C/A, i.e. less than -40 dB, the filters with narrower bandwidths yield the lowest bit error rates. At high values of carrier to adjacent channel interference ratio C/A, the filters with wider bandwidths yield the lowest bit error rates. By viewing the plot, the best tradeoff of bit error rate to adjacent channel protection may be determined. For example, the optimal filters for this application would be the filter with the widest bandwidth ( $w=1.25$ ) for values of C/A greater than -20 dB while the filter with the narrowest bandwidth ( $w=1.0$ ) would be optimal for values of C/A less than -40 dB. One or more predetermined thresholds may be selected depending on the embodiment of the invention implemented. Once selected, the predetermined thresholds and corresponding filter bandwidths are stored in the look-up table 15 in memory 14. In operation, when the measured signal strength ratio  $\rho_{lr}$  equals or passes the stored threshold values of the carrier to adjacent channel interference ratio C/A, the receiver switches to the optimal filters indicated in the look-up table 15.

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<sup>2</sup>See the outstanding Office Action at page 4.

As it may be seen at least from the above, Khayrallah is silent about a specific filter selector making an adaptive filter selection and is using as criteria for the filter selection an interference reference value.

With regard to Mitra, Mitra is also silent regarding the amended feature of Claim 23, namely “the channel estimator including a filter selector configured to select a filter for channel estimation from a plurality of available filters based on an interference reference value supplied to the filter selector.” Mitra describes the implementation of a block all pass filter at a first stage and the implementation of an optimal allpass filter as a second stage to obtain the coefficients of an optimal allpass stage, and as a result to improve system performance without computational complexity. It is respectfully submitted that Mitra does not disclose the channel estimator of the claimed invention and much less that said channel estimator comprises “a filter selector configured to select a filter for channel estimation from a plurality of available filters based on an interference reference value supplied to the filter selector.”

As none of the cited references teach or suggest “a channel estimator” as defined in amended Claim 23, Claim 23 (and Claims 24-26 and 33 dependent therefrom) is patentable over Li in view of Khayrallah and further in view of Mitra.

Amended Claim 27 recites in part:

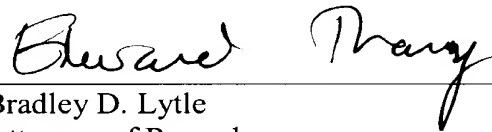
performing a channel estimation on the basis of received pilot symbols;  
***performing, adaptively, a filter selection for channel estimation by a filter selector, the filter selector selecting from a plurality of available filters based on an interference reference value supplied to the filter selector;*** and  
performing, by a filter, a channel estimation for data symbols between pilot symbols, said filter being further adaptively selected from the plurality of available filters based on a Doppler frequency of the data symbol to be channel estimated, said channel estimation being based on an estimated carrier to interference value ratio, the estimated carrier being a wanted carrier power value at a frequency subcarrier and a timeslot of a data symbol to be channel estimated.

As noted above, none of the cited references teach or suggest adaptively selecting a filter from a plurality of available filters based on an interference reference value. Consequently, the proposed combination cannot teach or suggest “performing, adaptively, a filter selection” as defined in amended Claim 27, and thus Claim 27 (and Claims 28-31 dependent therefrom) is also patentable over Li in view of Khayrallah and further in view of Mitra.

Accordingly, the pending claims are believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.

A handwritten signature in dark ink, appearing to read "Bradley D. Lytle", is written over a horizontal line.

Bradley D. Lytle  
Attorney of Record  
Registration No. 40,073

Customer Number  
**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 08/07)

Edward W. Tracy, Jr.  
Registration No. 47,998